

Table of Contents

Preface	xiii
Chapter I Fundamentals of Turbulent Combustion	1
Analytic Modeling of Turbulent Shear Flow with Chemical Reaction WILLIAM B. BUSH and FRANCIS E. FENDELL	3
Transition and Structure of Turbulent Jet Diffusion Flames T. TAKENO and Y. KOTANI	19
Experimental Investigation of Flow Turbulence Effects on Premixed Methane-Air Flames K.O. SMITH and F.C. GOULDIN	37
Some Observations on Turbulent Mixing with Chemical Reactions R.B. EDELMAN and P.T. HARSHA	55
Chapter II Turbulent Flame Modeling	103
A Simple Model for the Rate of Turbulent Combustion D. BRIAN SPALDING	105
Aspects of Turbulent Combustion A.K. VARMA, E.S. FISHBURNE, and C. duP. DONALDSON	117
Effect of Mixing Rate on Pressure Fields in Chemical Laser Cavities S.W. ZELAZNY and W.L. RUSHMORE	141
Description and Validation of a Three-Dimensional Procedure for Combustion Chamber Flows M.M.M. ABOU ELLAIL, A.D. GOSMAN, F.C. LOCKWOOD, and I.E.A. MEGAHED	163
Chapter III Turbulent Combustion Diagnostics	191
Measurements on Turbulent Hydrogen Flames in a Circular Duct J.C.F. WANG and B.W. GERHOLD	193
Measurement and Calculation of Furnace-Flow Properties P. HUTCHINSON, E.E. KHALIL, and J.H. WHITELAW	211
Laser Velocimeter Measurements of the Structure of Turbulent Spray Flames F.K. OWEN	229
Particle Size and Velocity Measurement by Laser Anemometry A.J. YULE, N.A. CHIGIER, S. ATAKAN, and A. UNGUT	247
Diagnostics of Rocket Plume-Airstream Turbulent Mixing Using Laser-Raman Scattering W.D. WILLIAMS, H.M. POWELL, R.L. McGUIRE, L.L. PRICE, J.H. JONES, D. P. WEAVER, and J.W.L. LEWIS	273

Laser Based Diagnostic Techniques for Combustion Research	291
S. LEDERMAN	
Application of Sampling Probes in Turbulent Supersonic Diffusion Flames	311
H. WILHELMI and G. GROSS	
Chapter IV Applications of Combustion Models	329
Turbulent Combustion in a Stirred Combustor	331
J.C. BONNIOT, R. BORGHI, and P. MAGRE	
Stirred Reactor Modeling of a Low-Pollution Liquid-Fueled Combustor	351
D.S. PRIOR, J. SWITHENBANK, and P.G. FELTON	
Transition to Detonation in an Unconfined Turbulent Medium	379
A.A. BONI, M. CHAPMAN, J.L. COOK, and G.P. SCHNEYER	
Hydrocarbon Turbulent Diffusion Flame in Subsonic Cross Flow	407
T.A. BRZUSTOWSKI	
Chapter V Experiments in Turbulent Combustion	431
Quenching Distance and Minimum Ignition Energy in Turbulent Flowing Mixtures	433
D.R. BALLAL and A.H. LEFEBVRE	
Experimental Study of Reactive Turbulent Mixing	449
L.P. COOPER, C.J. MAREK, and R.A. STREHLOW	
Experimental Investigation of Rough Burning in a Dump Combustor of a Small Volume	471
P. ROY CHOUDHURY and M. LOBELL	
Index to contributors to Volume 58	485